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Avoiding cancer risk information

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ABSTRACT

Rationale: Perceived risk for health problems such as cancer is a central construct in many models of health decision making and a target for behavior change interventions. However, some portion of the population actively avoids cancer risk information. The prevalence of, explanations for, and consequences of such avoidance are not well understood.

Objective: We examined the prevalence and demographic and psychosocial correlates of cancer risk information avoidance preference in a nationally representative sample. We also examined whether avoidance of cancer risk information corresponds with avoidance of cancer screening.

Results: Based on our representative sample, 39% of the population indicated that they agreed or strongly agreed that they would "rather not know [their] chance of getting cancer." This preference was stronger among older participants, female participants, and participants with lower levels of education. Preferring to avoid cancer risk information was stronger among participants who agreed with the beliefs that everything causes cancer, that there's not much one can do to prevent cancer, and that there are too many recommendations to follow. Finally, the preference to avoid cancer risk information was associated with lower levels of screening for colon cancer.

Conclusion: These findings suggest that cancer risk information avoidance is a multi-determined phenomenon that is associated with demographic characteristics and psychosocial individual differences and also relates to engagement in cancer screening.

1. Avoiding cancer risk information

Modern health communication efforts (e.g., cigarette warning labels, mass media campaigns, physician advice) assume that health information can influence personal behaviors, and also that people welcome health information. Although the former may be true, the latter is questionable. In fact, empirical evidence suggest that people may actively avoid personal health information (Barbour et al., 2012; Sweeny et al., 2010). In the current paper, we examined the prevalence of a preference to avoid risk information—specifically, the preference to avoid knowing one's personal risk for cancer—in a nationally representative dataset. We also examined demographic, psychosocial, and belief correlates with the preference not to know one's cancer risk. Understanding the prevalence, causes and consequences of information avoidance is necessary for researchers to develop effective interventions to prevent problematic avoidance, such as avoiding information about cancer screening, which may reduce adherence to cancer screening guidelines.

1.1. Prevalence of information avoidance

Several studies document that people sometimes avoid health information. For example, one study found that 21% of college women and 24% of women age 35 and older opted not to learn their breast cancer risk (Melnyk and Shepperd, 2012). Other research has

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documented avoidance of health information in different populations and across different diseases (Howell and Shepperd, 2012, 2013a, 2013b; Van der Meer et al., 2013; van Koningsbruggen and Das, 2009; Weitzman et al., 2001).

However, studies of health information avoidance generally, and cancer information specifically, typically have two limitations. First, they tend to be experimental, with researchers manipulating characteristics of risk information (Dawson et al., 2006; Yaniv et al., 2004). Although useful in understanding mechanisms underlying information avoidance, they can have limited utility for understanding how people respond in an everyday context. Second, they tend to rely on convenience samples (Howell and Shepperd, 2012, 2013a, 2013b) or samples of individuals with specific, sometimes rare, medical conditions (e.g., genetic risk for Huntington's Disease; Van der Steenstraten et al., 1994; Shiloh et al., 1999). As a consequence we do not know the prevalence of information avoidance in the population nor whether avoidance is related to demographic factors (e.g., gender, age, income).

1.2. *Predictors of information avoidance*

Compared with diseases such as diabetes and cardiovascular disease, cancer may seem particularly threatening because people view it as a death sentence (Moser et al., 2013). The extended parallel processing model (Witte, 1992) proposes that people confronting threating information—such as cancer risk information—can respond in one of two ways. First, they can direct efforts toward reducing the threat by, for example, gathering more information about cancer and cancer risk factors (i.e., engage danger control processes). Second, they can direct efforts toward escaping negative emotions evoked by the threat by, for example, avoiding information related to the threat (i.e., engage fear control processes). Confidence in one's ability to perform a risk-reducing behavior (i.e., self-efficacy) is an essential factor differentiating danger and fear control responses (Witte, 1992). People with high self-efficacy will be more likely to engage in danger control responses such as cancer risk information seeking, but people with low self-efficacy will be more likely to engage in fear control processes like avoiding cancer risk information.

By definition, threats that are uncontrollable do not allow people to take protective action. Thus, self-efficacy for uncontrollable threats is likely to be very low. Consistent with this premise are findings indicating that people display greater information avoidance for uncontrollable than controllable outcomes. For instance, women in one study were more likely to avoid learning their risk for breast cancer after reading about uncontrollable predictors of breast cancer than after reading about controllable predictors (Melnyk and Shepperd, 2012). Other studies demonstrate that people are more likely to avoid learning their risk for an untreatable disease than for a treatable disease (Dawson et al., 2006; Howell and Shepperd, 2012, 2013b; Shani et al., 2008). These findings suggest that people might avoid cancer information if they believe that cancer is uncontrollable or untreatable. They further imply that having fatalistic, pessimistic, or helpless views about cancer will correspond with avoidance of cancer risk information.

The extended parallel processing model also states that individual difference variables, such as anxiety and possibly coping (So, 2013), can contribute to self-efficacy (Witte, 1998). Addressing a threat requires that people possess sufficient coping resources. People who lack coping resources may have low self-efficacy to address health problems and therefore be more inclined to engage in fear control than danger control processes. Evidence suggests that people are more likely to avoid health information to the extent that they lack personal and interpersonal resources to manage bad news (Howell et al., 2014). For example, women in one study were more likely to avoid receiving personal risk feedback for breast cancer when they felt they lacked the coping resources to manage a diagnosis (Melnyk and Shepperd, 2012). These findings suggest that having fewer coping resources should correspond with greater avoidance of cancer information.

Cancer risk information avoidance may represent a broader tendency to avoid health risk information. Thus, it is possible that avoiding personal cancer risk information will correlate with more general measures of health information seeking. However, we argue that avoiding cancer information is distinct from seeking cancer information. Specifically, theorists distinguish avoidance from passively *not seeking* (Sweeny et al., 2010) because people may opt not to seek information because they are uninterested, but still not actively avoid the information. This suggests that avoidance of cancer information would likely be uncorrelated with more general measures of health information seeking.

1.3. *Consequences of information avoidance*

Information avoidance is problematic for at least two reasons. First, avoiding risk information can lead to a biased perception of one's actual risk (Jemmott et al., 1986; Liberman and Chaiken, 1992), for diseases that are largely asymptomatic (e.g., ovarian cancer), or diseases for which a genetic screening test can determine risk prior to the onset of disease (e.g., breast cancer). In addition, information avoidance may undermine preventive health behaviors. Second, it can pose a problem for health conditions that have a relatively narrow window in which screening is effective and in which people can take action to reduce harm or improve treatment outcomes. This second possibility is particularly intriguing and leads to the questions of whether individual differences in the preference to avoid cancer information might correspond with lower screening uptake. Other studies find that a strong motivation to avoid health information corresponds with lower intentions to undergo screening for oral cancer (Shepperd et al., 2014) and with lower intentions to undergo genetic screening (Taber et al., 2015). Although these studies examined intentions, not behavior, the findings suggest that people who report a strong preference to avoid learning their cancer risk might be less likely to follow recommended guidelines for cancer screening.

1.4. *Current study*

We examine cancer information avoidance using data from the fourth Health Information National Trends Survey (HINTS 4). In the 2012 iteration (i.e., Cycle 2) of the survey, participants reported the degree to which they would rather not know their chances of getting cancer. Because the HINTS sample was population-based and nationally representative, responses to the item permit estimation of the prevalence of a preference not to know one's (cancer) risk in the US adult population and to examine the demographic and psychosocial correlates of a preference not to know one's cancer risk (Nelson et al., 2004).

The present research addresses four primary questions. First, what is the prevalence of avoidance of cancer risk information? We examined the percent of US adults that would rather not know their risk for cancer. Second, who prefers to avoid cancer risk information? We explored whether avoidance of cancer risk information differs by factors such as gender, race, age and education. Third, what psychosocial factors predict cancer risk information avoidance in the population? Fourth, does cancer risk information avoidance relate to engagement in cancer screening? We predicted that people who report that they prefer to avoid cancer risk information would be less likely to undergo screenings for breast, cervical, prostate, and colon cancer.

2. Methods

2.1. Study design and participants

We analyzed cross-sectional data from Cycle 2 of the Health Information National Trends Survey (HINTS; http://hints.cancer.gov). Participants received the survey by mail plus a $2 incentive to encourage completion. Data collection lasted from October 2012 to January 2013. Details of the sampling design and methodology are available at: http://hints.cancer.gov/docs/HINTS_4_Cycle2_Methods_Report.pdf.

Of the initial 12,057 participants invited to participate, 3630 returned completed surveys, a 39.9% response rate. In the HINTS survey, only participants who had never been diagnosed with cancer completed the item assessing cancer information avoidance. Therefore, our analyses excluded respondents who had received a cancer diagnosis or who skipped or provided an invalid response to the item, resulting in a final analysis sample size of $N = 2974$.

2.2. Measures

The specific wording of all measures reported in this study appears at: http://hints.cancer.gov/docs/HINTS_4_Cycle_2_English.pdf. Within the categories below, we combined items to make composite items when the items were sufficiently correlated to produce reliable indices, and examined items individually when they did not.

2.2.1. Cancer risk information avoidance

To assess cancer risk information avoidance, we examined responses to an item that stated, “I'd rather not know my chance of getting cancer” (1 = *strongly agree*; 4 = *strongly disagree*). For all analyses, we reversed coded this item so that higher numbers indicated greater preference to avoid information. This item originates from an 8-item scale of information avoidance that is internally and temporally consistent, predicts both avoidance intentions and behaviors, and correlates with predictors of behavioral avoidance such as coping resources (e.g., Howell et al., 2014). In other research, this single item correlates highly with avoidance behavior including choosing to avoid one's risk for melanoma skin-cancer, choosing not to be tested for the BRCA gene, and choosing to avoid one's risk for a (fictitious) disease (Howell and Shepperd, 2014). Thus, while a 1-item measure may not be ideal, this item provides a meaningful way to measure information about one's receptivity to information about cancer risk.

2.2.2. Demographics

Demographic predictors included health insurance status (“Do you have any kind of health care coverage?”), family cancer history (“Have any of your family members ever had cancer?”), age, education level, race/ethnicity, income, and whether the participant was born in the United States (“Were you born in the USA?”). Table 1 presents the response format for specific items as well as the distribution of responses. We collapsed the race/ethnicity variable into four categories (White, Hispanic, African American, and all other races/ethnicities).

2.2.3. Health information seeking

Seven items assessed information related to searching for and using health information. One item asked about general health information seeking (“Have you ever looked for information about health or medical topics from any source?”) and another asked about health-information seeking related to cancer (“Have you ever looked for information about cancer from any source?”). Participants answered yes (1 = *yes*) or no (0 = *no*) to these items. Four items assessed participants' experience with their last health-information search. Specifically, participants read the following stem: “Based on the results of your most recent search for information about cancer, how much do you agree or disagree with each of the following statements?” Participants then responded to the following items: 1) “It took a lot of effort to get the information you needed”, 2) “You felt frustrated during your search for the information”, 3) “You were concerned about the quality of the information”, and 4) “The information you found was hard to understand” (1 = strongly *agree*, 4 = *strongly disagree*). We reverse coded these items so that higher numbers indicated more agreement. A final item asked participants, “Overall, how confident are you that you could get advice or information about cancer if you needed it?” (1 = *completely confident*, 5 = *not at all confident*). We combined these last five items to form a general index of health information seeking ($\alpha = .83$).

2.2.4. Beliefs about behavior, genetics, and cancer

Participants indicated how much they believed health behaviors determined whether they developed five common conditions: “How much do you think health behaviors like diet, exercise and smoking determine whether or not a person will develop each of the following conditions?” (1 = *a lot*; 4 = *not at all*). The conditions were 1) diabetes/high blood sugar, 2) obesity, 3) heart disease, 4) high blood pressure/hypertension, and 5) cancer. We averaged the five items to create a single index of beliefs about behavior ($\alpha = .89$). Participants also indicated how much they believed genetics determined whether they developed these same five common conditions: “How much do you think genetics, that is characteristics passed from one generation to the next, determine whether or not a person will develop each of the following conditions?” We again averaged the five items to create a single index of beliefs about genetics ($\alpha = .89$). Finally, from each index we extracted then analyzed separately the single item pertaining specifically to cancer.

Four items assessed general beliefs about cancer. These items were, 1) “It seems like everything causes cancer,” 2) “There's not much you can do to lower your chances of getting cancer,” 3) “There are so many different recommendations about preventing cancer, it's hard to know which ones to follow”, and 4) “Some cancers are slow growing and need no treatment” (1 = *strongly agree* and 4 = *strongly disagree*). We reverse coded these items so that higher numbers indicate agreement with these beliefs then analyzed each item separately.

2.2.5. Social support

Two items assessed available social support. HINTS does not permit examination of coping strategies or resources directly. Thus, we used social support as a proxy for coping resources in light of evidence that greater social support corresponds with greater coping resources (Cohen and Wills, 1985). The first asked, “Is there anyone you can count on to provide you with emotional support when you need it—such as talking over problems or helping you make difficult decisions?,” and the second asked, “Do you have friends or family members that you talk to about your health?” (1 = *no*; 2 = *yes*). These two items were highly correlated ($r = .52$, $p < .001$). Thus, we combined them.

2.2.6. Cancer risk perceptions

Three items assessed perceptions of cancer risk: “How likely are you to get cancer in your lifetime?” (1 = *very unlikely*; 5 = *very likely*); “Compared to other people your age, how likely are you to

Table 1
Demographic information.

	N	*Weighted %*	*Weighted N*
Gender			
Male	1137	49.36%	1446
Female	1794	50.64%	1484
Education			
Less than 8th grade	69	3.28%	97
8–11 years of high school	188	9.53%	280
12 years or completed high school	636	20.43%	602
Post-high school training (other than college)	224	7.28%	214
Some college	638	29.88%	880
College Graduate	758	19.36%	570
Postgraduate	435	10.24%	301
Race/Ethnicity			
Non-Hispanic White	1682	66.42%	1821
Hispanic	441	15.07%	413
Non-Hispanic Black/African American	435	11.17%	306
All other races	185	7.34%	201
Household Income			
Less than $20,000	603	21.28%	564
$20,000–<$35,000	423	14.76%	391
$35,000–<$50,000	379	15.57%	413
$50,000–<$75,000	449	16.86%	447
More than $75,000	799	31.53%	836
Born in the United States			
Yes	2527	85.17%	2527
No	441	14.83%	440
Health Insurance Status			
Yes	2999	82.18%	2945
No	584	17.82%	638
Family Cancer History			
Yes	1985	71.28%	1958
No	763	28.73%	789

get cancer in your lifetime?" (1 = *much less likely*; 5 = *much more likely*); and "Select one answer that best represents your opinion about the statement: 'I feel like I could easily get cancer in my lifetime.'" (1 = *I feel very strongly that this will NOT happen*; 5 = *I feel very strongly this WILL happen*). These two items were correlated ($r = .61$, $p < .01$), and thus we combined them in our analyses ($\alpha = .82$).

2.3. Screening behaviors

We examined participants' screening behaviors based on the recommendations made by the American Cancer Society (ACS), because people are likely most familiar with its recommendations.

2.3.1. Colon cancer

One item asked about screening for colon cancer. The item was preceded by a description of three types of testing procedures for colon cancer (colonoscopy, sigmoidoscopy, stool blood test) then asked participants whether they had undergone one of these tests to check for colon cancer (1 = *yes*; 0 = *no*). The ACS recommends colon cancer screening for all people ages 50 and older (American Cancer Society, 2013b) and thus we restricted our analyses of colon cancer screening to respondents 50 and older of whom 70.4% had undergone a colon cancer screening.

2.3.2. Prostate cancer

One item asked men if they had ever had a prostate-specific antigen (PSA) test (1 = *yes*, 0 = *no*). The ACS recommends that all men age 50 and older receive yearly PSA screenings (American Cancer Society, 2013c). We restricted our analyses of prostate cancer screening to men ages 50 and older, of whom 68.7% had undergone a PSA examination.

2.3.3. Breast cancer

One item asked women when they had their most recent mammogram to check for breast cancer. Response options were, 1 = *a year ago or less*; 2 = *more than 1, up to 2 years ago*; 3 = *more than 2, up to 3 years ago*; 4 = *more than 3, up to 5 years ago*; 5 = *more than 5 years ago*; 6 = *I have never had a mammogram*. The ACS recommends yearly mammograms for women over the age of 40 (American Cancer Society, 2013a). We distinguished between women who underwent screening in the previous year (coded as 1) and women who had screened more than a year ago or never (coded as 0). We restricted our analyses to women ages 40 and older, of whom 58.56% underwent screening in the previous year.

2.3.4. Cervical cancer

One item asked women how long ago they had their most recent pap test to check for cervical cancer and included the same response options used for breast cancer screening. The ACS recommends that all women age 21–29 receive screenings every three years and women age 30–65 received a screening every 5 years (Saslow et al., 2012). We thus restricted our analyses to women age 21–65. Similar to the breast cancer screening, we distinguished between women who did (coded as 1) and did not (coded as 0) meet the recommended guidelines. Within our sample, 87.18% of women met the recommended guidelines.

2.4. Analytic strategy

Consistent with recommendations for analyzing HINTS data, we used jackknife replicate sample weights in all analyses to correct for oversampling and to generalize to the population (see http://hints.cancer.gov for further details). We conducted a series of weighted linear regressions to separately examine the predictors of information avoidance. We used weighted logistic regressions to examine whether avoidance was associated with screening. We controlled for education, annual household income, race/ethnicity, age, and health insurance status in the logistic regressions. We also included gender as a covariate in the colon cancer analyses as colon cancer screening was the only test applicable to both men and women. Item-level missing data ranged from 1.29% for health insurance status to 13.22% for income. For all regression analyses, we used listwise deletion for missing data. To control for Type-1 error, we set our significance level at $p < .01$.

3. Results

3.1. What is the prevalence of cancer risk avoidance?

The population weighted mean response to the cancer risk information avoidance item was 2.19 ($SE = .03$) on the 4-point scale. More informative is the distribution of responses to the question. As evident in Fig. 1, 39% of US adults agreed (either strongly or somewhat) that they did not want to know their risk for cancer.

3.2. Who avoids cancer risk information?

As evident in Table 2, we observed greater cancer risk information avoidance among older respondents and respondents with lower levels of education. Because we set the significance level to .01, we do not regard the effect for gender, race or being born in versus outside the US to be statistically significant. Income, family history of cancer, and health insurance status were also unrelated to information avoidance.

3.3. What predicts cancer risk avoidance?

3.3.1. Health information seeking

Responses to our index of health information seeking items was unrelated to cancer risk information avoidance, $t(49) = 1.63$, $p = .109$, suggesting that cancer risk avoidance is distinct from general health information seeking.

3.3.2. Beliefs

We conducted several regression analyses to examine whether the cancer beliefs predicted avoidance. Each row in Table 3 shows the results of a separate regression analysis.

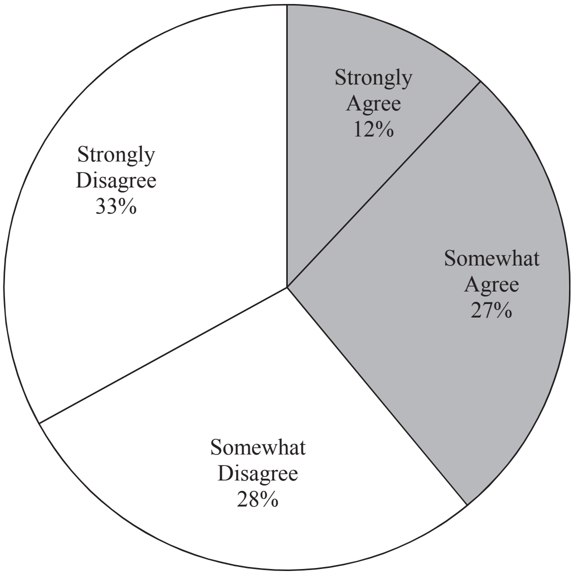

Fig. 1. Information Avoidance. *Note.* Distribution of responses to the item, "I'd rather not know my chance of getting cancer."

The less people believed that behavior determined their health outcomes in general and their cancer status specifically, the more they preferred to avoid cancer risk information. Greater cancer risk information avoidance also corresponded with greater fatalistic/lack of control beliefs about cancer. Cancer risk information avoidance was unrelated to beliefs about genetics and health outcomes in general and getting cancer specifically.

3.3.3. Social support

Surprisingly, social support was unrelated to cancer risk information avoidance, $t(49) = .85$, $p = .401$. We return to this unexpected effect in the discussion.

3.3.4. Cancer risk perception

Cancer risk information avoidance was unrelated to perceived risk for cancer, $t(49) = .21$, $p = .835$.

3.4. Is cancer risk information avoidance associated with cancer screening?

Cancer risk avoidance was unrelated to reports of having a mammography screening, $OR = .97$, $t(42) = -.31$, $p = .768$, cervical cancer screening, $OR = .99$, $t(42) = -.10$, $p = .918$, and prostate cancer screen, $OR = .75$, $t(42) = -1.93$, $p = .059$ (see Table 4). In partial support of our hypothesis, respondents who reported greater cancer risk information avoidance were less likely to be screened for colon cancer, $OR = .71$, $t(41) = -3.74$, $p < .001$. Because the avoidance item did not predict either of the female-linked cancers, we reexamined colon cancer screening after including gender and the gender × avoidance interaction in the regression model. The interaction was not statistically significant ($OR = 1.07$, $t(40) = .33$, $p = .746$), indicating that responses to the avoidance measure predicted colon cancer screening for both men and women.

Preliminary analyses revealed that participants' history of comorbid conditions (arthritis, depression, diabetes, heart disease, high blood pressure, and lung disease) was unrelated to cancer risk information avoidance. This was true both for separate examination of presence/absence of each comorbid condition and for examination of the number of comorbid conditions reported. Likewise, engagement in other health-related behaviors (smoking, sunscreen use, exercise, and fruit/vegetable consumption) were unrelated to cancer risk information avoidance. Of note, both comorbid conditions and the health behaviors were associated with prior screening.

4. Discussion

Analysis revealed that 39% of participants somewhat or strongly agreed that they do not want to know their risk of getting cancer. Assuming the HINTS sample is representative of the population, as it is designed to be (Nelson et al., 2004), we can extrapolate that roughly 89 million of the estimated 240 million adults in the United States do not want to know their risk for cancer. Cancer risk information avoidance was greater among participants who were older and less educated. Although some of these findings (e.g., greater avoidance corresponds with less education) are consistent with other recent findings for physician avoidance (Persoskie et al., 2014), we examined avoidance of cancer risk information specifically.

Consistent with experimental evidence showing that people display greater information avoidance when they believe an outcome is uncontrollable (Melnyk and Shepperd, 2012; Taber

Table 2
Relationship between demographic variables and information avoidance.

	Regression slope	95% *CI*	Jackknifed *SE*	*t*	*p*	R^2
Age	**.008**	**[.004, .01]**	**.002**	**3.66**	**.001**	**.019**
United States born (0 = no, 1 = yes)	.215	[.03, .40]	.093	2.32	.025	.005
Education	**−.091**	**[−.15, −.03]**	**.030**	**−3.04**	**.004**	**.011**
Gender (0 = male, 1 = female)	.129	[.02, .24]	.056	2.30	.026	.004
Income	−.036	[−.08, .01]	.024	−1.49	.143	.003
Family history of cancer (0 = no, 1 = yes)	−.051	[−.21, .11]	.079	−.64	.523	.001
Health insurance status (0 = no, 1 = yes)	.016	[−.19, .22]	.101	.16	.872	.009
Race/Ethnicity (ref = White)						.007
Hispanic	−.134	[−.33, .06]	.097	−1.38	.172	
Black	−.244	[−.44, −.05]	.096	−2.55	.014	
Other	−.128	[−.40, .14]	.135	−.95	.348	

Note: Bold rows indicate a significant relation with information avoidance at $p < .01$.
Standardized beta weights cannot be determined using the jackknife replicate weights.
CI = Confidence interval. *SE* = Standard error.

Table 3
Weighted linear regression analyses of beliefs about health and cancer on avoidance.

	Mean (*SE*)	Regression slope	95% *CI*	Jackknifed *SE*	*t*	*p*	R^2
Beliefs about behavior and health							
Index: Behavior determines health outcome	**3.49 (.02)**	**−.209**	**[−.35, −.08]**	**.067**	**−3.11**	**.003**	**.017**
Behavior determines cancer	**3.18 (.02)**	**−.163**	**[−.25, −.08]**	**.043**	**−3.76**	**.001**	**.019**
Beliefs about genetics and health							
Index: Genetics determines health outcomes	3.17 (.01)	−.061	[−.16, .04]	.051	−1.20	.237	.002
Genetics determines cancer	3.17 (.02)	−.041	[−.13, .05]	.045	−.90	.375	.001
General cancer beliefs							
Everything causes cancer	**2.72 (.03)**	**.132**	**[.05, .21]**	**.038**	**3.42**	**.001**	**.015**
Hard to lower cancer risk	**2.06 (.02)**	**.273**	**[.21, .34]**	**.033**	**8.20**	**.001**	**.053**
Hard to know what recommendations to follow	**2.92 (.03)**	**.119**	**[.03, .21]**	**.043**	**2.73**	**.009**	**.010**
Some cancers are slow growing	**1.95 (.04)**	**.135**	**[.06, .22]**	**.040**	**3.38**	**.001**	**.017**

Note: Bold rows indicate a significant relation with information avoidance at $p < .01$.
Standardized beta weights cannot be determined using the jackknife replicate weights.
CI = Confidence interval. *SE* = Standard error.

Table 4
Logistic regression analyses for information avoidance on screening behaviors.

	Breast cancer	Cervical cancer	Prostate cancer	Colon cancer
	OR [95% *CI*]	*OR* [95% *CI*]	*OR* [95% *CI*]	*OR* [95% *CI*]
Education	1.07 [.85–1.36]	1.08 [.86–1.35]	1.02 [.98–1.49]	1.13 [.98–1.30]
Income	1.45 [1.09–1.92]	1.37 [1.06–1.78]	1.32 [1.08–1.61]*	1.41 [1.19–1.66]*
Race/Ethnicity				
Hispanic	3.82 [1.35–10.85]*	1.33 [.47–3.80]	1.72 [.73–4.08]	1.45 [.75–2.78]
Black	3.71 [1.49–9.20]*	1.88 [.83–4.26]	1.86 [.78–4.43]	1.78 [1.07–2.96]
Other	.66 [.11–4.15]	.63 [.18–2.25]	.50 [.16–1.54]	1.04 [.47–2.29]
Age	1.04 [.99–1.10]	.98 [.95–1.01]	1.09 [1.05–1.13]*	1.13 [1.10–1.17]*
Health Insurance	.41 [.16–1.08]	.51 [.25–1.03]	.64 [.27–1.54]	.61 [.38–.99]
Gender	–	–	–	1.20 [.80–1.79]
Cancer information avoidance	1.01 [.74–1.39]	.99 [.76–1.28]	.75 [.56–1.01]	.71 [.59–.85]*

Note: * indicate a significant relation with information avoidance at $p < .01$.
OR = Odds ratio. *CI* = Confidence interval.

et al., 2015), we also found that the less people believed that behavior influences health outcomes and getting cancer, the more they wanted to avoid learning their cancer risk. In addition, consistent with evidence that people may be disinclined to believe that genetics determines their health outcomes (Condit, 2011), people's beliefs about the influence of genetics on health outcomes and getting cancer were unrelated to whether they wished to learn their cancer risk.

We also found that general cancer beliefs predicted avoidance of cancer risk information. Specifically, fatalistic beliefs about cancer (i.e., the belief that everything causes cancer and there is not much one can do to avoid cancer), as well as uncertainty about how to prevent cancer and the belief that some cancers need no treatment, corresponded with greater cancer risk avoidance. Collectively, these items suggest that people may find little value in learning their cancer risk if they perceive cancer as unavoidable, lack clarity on how to reduce their risk, or see cancer as requiring no attention.

Several additional findings deserve mention. First, cancer risk information avoidance was unrelated to general information seeking. This finding is important because it reveals that avoidance of information pertinent to one's risk for cancer is distinct from other forms of information seeking inclinations. Second, we found no relationship between cancer risk perceptions and cancer risk information avoidance. This finding is consistent with other research showing no relationship between risk likelihood estimates and avoidance (Howell and Shepperd, 2013b; Melnyk and

Shepperd, 2012). Moreover, research on screening suggests that people who are at greatest risk are often the people most likely to undergo screening (Lerman et al., 1996). We suspect that other possible predictors of information avoidance are perceptions of the usefulness of the information and the extent to which people believe the news will make them feel bad (Sweeny et al., 2010).

Finally, our measure of cancer risk information avoidance predicted screening for colon cancer. Although other data (Howell et al., 2012) suggest a link between information avoidance and screening intentions, our data are the first to link an individual difference measure of information avoidance to actual screening. Interestingly, our measure of cancer risk information avoidance did not predict prostate, mammography or cervical cancer screening. We speculate that procedure involved in a colonoscopy may explain the divergent findings – given that colonoscopies are associated with substantial negative affect, especially disgust (Reynolds et al., 2013), and negative affect associated with colonoscopies is a known predictor of screening noncompliance (Kiviniemi et al., 2014; Worthley et al., 2006); it may be that individuals are especially motivated to avoid information about colonoscopy (given the association with negative emotions) and, to the extent that they have that motivation, especially unlikely to be screened.

Having a family history of cancer was unrelated to cancer information avoidance. Nevertheless, it is possible that people may avoid information only for a specific cancer for which they have a family history. Although the HINTS dataset does not include information about family history regarding specific cancers, we view this possibility as unlikely in light of research showing that people who are most at risk for a disease (e.g., including those with a family history of the disease) are also the ones most likely to screen for that disease (Kim et al., 2008; Thrasher et al., 2002).

Several agencies (e.g., the American Cancer Society, the US Preventive Services Task Force) offer conflicting recommendations regarding who should seek cancer screenings and whether screening is even advisable, particularly with regard to mammography and prostate cancers (Aleksic et al., 2013). It is possible that the conflicting recommendations created confusion that undermined our ability to find an effect for information avoidance on prior screening. Importantly, and arguing against this reasoning, is evidence that many women are unaware of the new recommendations (Kiviniemi and Hay, 2012).

4.1. Strengths and limitations

Our study has several strengths. It is the first to examine general propensities to avoid cancer risk information. It is also the first to explore whether the preference to avoid cancer risk information predicts screening in the general population. Third, the sample was large, and statistical weighting makes it approximate a nationally representative sample, allowing generalization to the United States adult population. The nature of this sample offers insight into the magnitude of avoidance of cancer risk information in the population and the need for interventions to decrease such avoidance.

Our study also has limitations. The response rate to the HINTS survey was 30.1%, which is a typical response rate for mailed surveys (Dillman, 2000). However, only those who had not had cancer before answered the information avoidance item, raising questions regarding how representative our sample is of the population. Second, the survey was cross-sectional and correlational, limiting our ability to make causal statements. Third, aspects of the study likely contribute to measurement error. Space limitations restricted the number of items available to measure many of the constructs and, many items, including our primary outcome measure, were single items or broadly written. It is common for large survey studies such as the HINTS survey to use single-items to measure particular constructs. In addition, many studies in psychology use single-item outcome measures of attitudes, motivations, intentions and behavior (Abraham and Sheeran, 2004; Bozionelos and Bennett, 1999; Senay et al., 2013).

Finally, it is possible that other variables (e.g., cancer risk factors) that we did not assess influence the decision to avoid cancer information or whether cancer avoidance influences screening uptake. Space limitations on the HINTS survey restricted inclusion of all possible factors that might be related to avoidance. The shortcomings in our study represent opportunities for future research.

4.2. Future directions

Our results raise intriguing questions and exciting directions for research. First, research links greater personal and interpersonal resources to less avoidance (Howell et al., 2014; Melnyk and Shepperd, 2012), yet we found no such relationship here. One possible reason for the null effect is that the two social support items were rather broad, one asking about someone who could provide emotional support in general and the other asking if participants had someone to talk to about their health. Perhaps more specific items would be more successful in predicting avoidance. The cancer risk information avoidance item was also broad and abstract, asking participants whether they would want to know their "chances of getting cancer" rather than whether they wanted to know their risk for a screening they just completed or the results of a biopsy. The broader measure may tap persistent individual differences that are uninfluenced by the availability of social support. Second, we found that a variety of cancer belief items predicted avoidance. We speculated that the common theme to these items is the perception that learning one's cancer risk has little utility. However, this idea remains untested.

Finally, our cancer avoidance item asked participants if they did not want to know their chances of getting cancer. Cancer, however, is a broad term that refers to a large spectrum of disease, and we do not know what participants were thinking when they responded. Were they thinking about a specific cancer or were they responding to a prototype? More importantly, what aspect of cancer prompted some participants to prefer ignorance over knowledge? Was it the misperception that a cancer diagnosis is tantamount to a death warrant, that it is painful and disfiguring, that it is uncontrollable, or something else? Clearly, we need more research.

4.3. Conclusion

Despite the limitations of our study, we found that a sizable proportion of the population—particularly people who are older, less educated, female, and hold fatalistic beliefs about cancer—wishes to avoid cancer risk information. Moreover, responding to our avoidance item corresponded with whether our participants had undergone colon cancer screening. Given the broad nature of the avoidance item, we suspect that it may underestimate the true level of avoidance of cancer risk information. That said, our findings suggest a barrier to screening that can be targeted by future intervention researchers.

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